

Breakfast, nutritional status, and socioeconomic outcome measures among primary school students from the City of Salta. A cross-sectional study

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ABSTRACT

Introduction. Socioeconomic context and family dynamics are determining factors when considering eating habits and nutritional status among students. It has been demonstrated that skipping breakfast or having a light breakfast has an unfavorable impact on nutritional status.

Objective. To establish a relationship among breakfast, sociodemographic outcome measures, and nutritional status among students attending public schools in the urban and peri-urban areas of the City of Salta.

Population and methods. Descriptive, cross-sectional study. Purposive, non-probability sampling of students attending urban and peri-urban primary schools (aged 9-13, boys and girls).

Outcome measures: breakfast at home (habit, "enKid" breakfast quality, frequency, duration), nutritional status (body mass index, Z-score, World Health Organization), and sociodemographic outcome measures (family type, level of education, employment, parents' breakfast habit, commensality). Analysis of frequency, associations, logistic regression, odds ratio, confidence interval, $p < 0.05$, WHO AnthroPlus and SPSS v18 software.

Results. Two hundred and eighty-three students were assessed; 49.8% attended urban schools. Overweight or obesity was observed in 46.0%. Also, 55.1% skipped breakfast at home on the day of the assessment; among those who did have breakfast, 79.5% had a poor or very-poor quality meal. Among those who skipped breakfast, 40.7% of the girls and 54.7% of the boys were overweight or obese. A greater socioeconomic vulnerability and a higher percentage of students who attended school without having breakfast were observed in peri-urban schools.

Conclusions. Eventually, the probability of skipping breakfast was associated with having a large family, absence of parental breakfast habit, a low level of maternal education, having breakfast alone, and being obese.

Key words: breakfast, student, nutritional status, socioeconomic context.

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INTRODUCTION

New lifestyles have resulted in changes in the traditional meal distribution pattern, which have an impact on the breakfast habit: people now eat a light breakfast or even skip it. In urban areas, the practice of eating at the same table has disappeared or become restricted to weekends, and although school cafeterias are now more relevant, the family still plays the main role in the development of eating habits.

Family meals do not only account for an eating model, they are also a meeting point and have implications which go beyond the health setting.¹ Living together as a family with your parents and eating breakfast with them are factors associated with a better breakfast habit among adolescents.²

Among other numerous demographic changes, there are now more single-parent households, as well as extended and/or compound families. Women-headed households have also increased³ together with the proportion of children in situations of vulnerability. These changes have an impact on family dynamics (increased women's labor force participation, minors in charge of minors) and on health, specifically on eating habits. At present, more than 50% of the worldwide population lives in urban or peri-urban areas. Peri-urban areas are characterized by marginalization and/or socioeconomic and environmental vulnerability whereas health, education, and hygiene indicators are usually better in urban areas.⁴

Breakfast may be defined as a solid meal eaten before starting the work or school day or before 11:00 am on

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the weekends⁵ or simply the first meal of the day; however, no definition underscores the importance of breakfast in the overall diet. Eating breakfast on a daily and regular basis has been associated with a better physical and intellectual performance. Its calorie intake is also closely related to the prevalence of obesity.^{6,7}

The objective of this study was to establish a relationship among breakfast habit, nutritional status, and sociodemographic outcome measures among students attending public schools in the urban and peri-urban areas of the City of Salta.

POPULATION AND METHODS

Descriptive, cross-sectional study. Students attending 5th, 6th, and 7th grade in two urban and two peri-urban schools from the City of Salta (April/June 2015) were assessed. This was a purposive, non-probability sample. Data source: primary.

Exclusion criteria: having an acute or chronic disease that affected nutritional status or the ability to complete questionnaires.

Outcome measures

Anthropometric

Age, sex, nutritional status. As per body mass index (BMI), malnutrition: ≤ -2 Z-score; normal nutritional status: > -2 Z-score, $< +1$ Z-score; overweight: $\geq +1$ Z-score; obesity: $\geq +2$ Z-score (BMI curves, Z-score, World Health Organization [WHO], by age and sex).⁸

Categories: normal nutrition/malnutrition (NW/M) and overweight/obesity (O/O).

A CAM 150 kg standing scale was used, as per the rules of the National Committee for Growth and Development of the Argentine Society of Pediatrics (Sociedad Argentina de Pediatría, SAP).⁹

Breakfast

Habit: eating breakfast on the day of the survey. Yes/no.

Frequency: always (6-7 days/week), sometimes (2-5 days/week), never (0-1 day/week).

Quality: including at least one dairy product, cereals, and fruits.

Categories

1. Ideal: including at least one product of each food group mentioned above.
2. Satisfactory: missing one food group.
3. Poor: missing two food groups.

4. Very poor: missing three food groups.

Breakfast duration: < 5 minutes / 5-15 minutes / > 15 minutes.

Commensality: eating alone/together as a family

Socioeducational and family context

Institutional: geographic location (urban/peri-urban area).

Number of family members sharing the household: large (≥ 6), not large (≤ 5).

Family type: nuclear/extended household.

Parental hub: presence of one/two parents, single-parent/two-parent, absence of parents.

Employment status of parents/adults in charge: working/not working.

Years of education completed by the parents/adults in charge: ≥ 12 years/ < 12 years.

Breakfast habit practiced by the parents/adults in charge: always/sometimes/never.

Breakfast preparation: parents/students/other.

Assessment of breakfast habits and setting: self-administered questionnaires completed by parents and students, close-ended and/or multiple choice questions.

This study was endorsed by the Ethics Committee of Hospital Público Materno Infantil de Salta. Informed consents and assents were obtained from participants.

Statistical analysis: the SPSS v18 and WHO AnthroPlus software were used. Distribution frequency and associations among categorical outcome measures, χ^2 test, and Fisher's test. Multivariate logistic regression model to establish the association among breakfast habit (dependent outcome measure), nutritional status, and sociodemographic outcome measures (odds ratio [OR], confidence interval [CI], $p < 0.05$).

RESULTS

A total of 143 girls and 140 boys were assessed; 49.8% attended urban schools. The mean age of students from urban schools was 10.84 years, and from peri-urban schools, 11.13 years. In the latter, 64.1% of students skipped breakfast on the day of the survey compared to 46.1% from urban schools. Most students sometimes had breakfast at home, and those from peri-urban areas skipped breakfast more often (9.1%). Besides, 79.5% of breakfasts were of a poor/very poor quality; this was more prevalent (86.3%) in the peri-urban area, as well as eating breakfast alone (8.6%). The overall prevalence of overweight/obesity was

46.0%, and that of malnutrition, 2.1% (Table 1).

The main differences observed in relation to the reality of families from peri-urban areas were the number of years of education completed by parents (69.0% of fathers and 59.7% of mothers of students from peri-urban students had not completed 12 years of education), the higher number of extended families (49.3%), with 6 or more family members (66.2%), and single-parent households (35.9%) (Table 2).

Among students who skipped breakfast, boys showed a greater prevalence of overweight/obesity (54.7%) (Table 3).

The bivariate analysis reflected different associations with the breakfast habit. The logistic regression model showed that a higher probability of skipping breakfast was associated with obesity, having breakfast alone, absence of breakfast habit, parents who had not completed 12 years of education, and having a large family (Tables 4 and 5).

DISCUSSION

It is concerning to see the number of students who skipped breakfast on the day of the survey (55.1%). The absence of this habit was associated with unfavorable family aspects, in addition to the absence of the parental breakfast habit and the presence of obesity in students.

As children get older, the number of adolescents who skip breakfast increases, together with a trend to reducing breakfast content and quality.¹

Present data from Spain¹⁰ show that 8.2% of the child and adolescent population attend school without eating breakfast; in Mexico, 19% of children and adolescents skip breakfast.¹¹ In the United Kingdom, approximately 20% of students do not have breakfast or only drink chocolate or some other beverage. The figures from different studies conducted in Great Britain and the United States range between 10% and 30%,⁷ with a continuous increase in the frequency, especially

TABLE 1: Characteristics of breakfast and nutritional status among students by school location in urban or peri-urban areas in the City of Salta

Outcome measures	Urban (N= 141)		Peri-urban (N= 142)		Total		p value
	n	%	n	%	n	%	
Sex							
Female	71	50.4	72	50.7	143	50.5	0.95
Male	70	49.6	70	49.3	140	49.5	
Breakfast							0.002*
Yes	76	53.9	51	35.9	127	44.9	
No	65	46.1	91	64.1	156	55.1	
Frequency							0.21
Always	48	34.0	38	26.8	86	30.4	
Sometimes	86	61.0	91	64.1	177	62.5	
Never	7	5.0	13	9.1	20	7.1	
Quality							9.4
Ideal	1	1.3	0	0.0	1	0.8	
Satisfactory	18	23.7	7	25	19.7	0.32	
Poor	50	65.8	39	13.7	89	70.1	
Very poor	7	9.2	5	76.5	9.8	12	
Breakfast duration							0.91
> 15'	17	12.7	18	14.1	35	13.4	
5-15'	81	60.4	78	60.9	159	60.6	
< 5'	36	26.9	32	25.0	68	26.0	
Commensality							0.18
Together as a family	128	95.5	117	91.4	245	93.5	
Alone	6	4.5	11	8.6	17	6.5	
Nutritional status							0.82
Normal	74	52.5	73	51.4	147	51.9	
Malnutrition	3	2.1	3	2.1	6	2.1	
Overweight	41	29.1	37	26.1	78	27.6	
Obesity	23	16.3	29	20.4	52	18.4	

Frequencies. χ^2 test: * p < 0.05.

among adolescents; the trend goes upwards among girls and low socioeconomic populations.¹²

In Argentina, a study conducted in students from 5 provinces found that not more than 15% of children had a good-quality breakfast and

confirmed that 4/10 students left home for school without having breakfast.¹³ In the city of Santa Fe, 75% of students eat breakfast every day; 21%, sometimes; and 4%, skip breakfast (similar to the findings of our study).¹⁴ Of these, 34.7% had a

TABLE 2: Characteristics of families by school location in urban or peri-urban areas in the City of Salta

Outcome measures	Urban (N= 141)		Peri-urban (N= 142)		Total		p value
	N	%	N	%	N	%	
Years of education completed by the father							
< 12 years	36	28.8	80	69.0	116	48.1	0.000*
≥ 12 years	89	71.2	36	31.0	125	51.9	
Years of education completed by the mother							
< 12 years	27	19.7	80	59.7	107	39.5	0.000*
≥ 12 years	110	80.3	54	40.3	164	60.5	
Does the father work?							
Yes	104	97.2	91	91.0	195	94.2	0.057
No	3	2.8	9	9.0	12	5.8	
Does the mother work?							
Yes	86	62.8	72	58.5	158	60.8	0.48
No	51	37.2	51	41.5	102	39.2	
Does the father have breakfast?							
Always	80	66.1	70	70.7	150	68.2	0.59
Sometimes	36	29.8	27	27.3	63	28.6	
Never	5	4.1	2	2.0	7	1.5	
Does the mother have breakfast?							
Always	105	76.6	107	80.5	212	78.5	0.34
Sometimes	31	22.6	23	17.3	54	20.2	
Never	1	0.8	3	2.2	4	1.5	
Family type							
Nuclear	88	62.4	72	50.7	160	56.5	0.047*
Extended	53	37.6	70	49.3	123	43.5	
Number of family members							
Up to 5	77	54.6	48	33.8	125	44.2	0.000*
≥ 6	64	45.4	94	66.2	158	55.8	
Parental hub							
Single-parent	36	25.5	51	35.9	87	30.7	0.045*
Two-parent	102	72.3	91	64.1	193	68.2	
Absence of parents	3	2.2	0	0.0	3	1.1	
Responsibility for preparing breakfast							
Parents	123	87.2	120	84.5	243	85.9	0.08
Students	11	7.8	6	4.2	17	6.0	
Other	7	5.0	16	11.3	23	8.1	

Frequencies. χ^2 test: * p < 0.05.

TABLE 3: Breakfast and nutritional status by sex among public school students from Salta

Total N= 283	Sex	Nutritional status				Total		p value
		Normal		Overweight/obesity		n	%	
		n	%	n	%			
Has breakfast	Female	38	61.3	24	38.7	62	100.0	0.23
	Male	33	50.8	32	49.2	65	100.0	
Skips breakfas	Female	48	59.3	33	40.7	81	100.0	0.082
	Male	34	45.3	41	54.7	75	100.0	

χ^2 test: p < 0.05.

good- or improvable-quality breakfast.¹⁵ Among the students in our study, 20.5% had an ideal- or satisfactory-quality breakfast.

The variation in reported values may be related to differences in age, population, and/or the “skipping breakfast” concept used in different studies.

The WHO has defined childhood obesity as the epidemic of the 21st century. “Worldwide, 10% of school-age children have excess body fat and an increased risk for chronic diseases.”¹⁶ In Argentina, 1/10 preschoolers is obese.¹⁷ Although the etiology of obesity is multifactorial, social determinants (low socioeconomic level) and

TABLE 4: Breakfast and sociodemographic outcome measures among public school students from Salta

Outcome measures	Has breakfast		Skips breakfast		Total		p value
	n	%	n	%	n	%	
Sex							
Female	62	43.4	81	56.6	143	50.5	0.60
Male	65	46.4	75	53.6	140	49.5	
Institutional context							
Urban	76	53.9	65	46.1	141	49.8	0.002*
Peri-urban	51	35.9	91	64.1	142	50.2	
Commensality							
Together as a family	121	49.4	124	50.6	245	93.5	0.046*
Alone	4	23.5	13	76.5	17	6.5	
Years of education completed by the father							
< 12 years	52	44.8	64	55.2	116	48.1	0.62
≥ 12 years	60	48.0	66	52.0	125	51.9	
Years of education completed by the mother							
< 12 years	40	37.4	67	62.6	107	39.5	0.033*
≥ 12 years	83	50.6	81	48.4	164	60.5	
Does the father work?							
Yes	95	48.7	100	51.3	195	94.2	0.93
No	6	50.0	6	50.0	12	5.8	
Does the mother work?							
Yes	79	50.0	79	50.0	158	60.8	0.16
No	42	41.2	60	58.8	102	39.2	
Does the father have breakfast?							
Always	84	56.0	66	44.0	150	68.2	
Sometimes	22	34.9	41	65.1	63	28.6	0.004*
Never	1	14.3	6	85.7	7	3.2	
Does the mother have breakfast?							
Always	108	50.9	104	49.1	212	78.5	
Sometimes	13	24.1	41	75.9	54	20.0	0.002*
Never	2	50.0	2	50.0	4	1.5	
Household composition							
Nuclear	82	51.3	78	48.7	160	56.5	
Extended	45	36.6	78	63.4	123	43.5	0.014*
Parental hub							
Single-parent	29	33.3	58	66.7	87	30.7	
Two-parent	98	50.8	95	49.2	193	68.2	0.007*
Absence of parents	0	0.0	3	100.0	3	1.1	
Number of family members							
Up to 5	70	56.0	55	44.0	125	44.2	0.001*
≥ 6	57	36.1	101	63.9	158	55.8	
Breakfast preparation							
Parents	116	47.7	127	52.3	243	85.9	
Students	3	17.6	14	82.4	17	6.0	0.033*
Other	8	34.8	15	65.2	23	8.1	

Frequencies. χ^2 test: * p < 0.05.

lifestyle (unhealthy diet, skipping breakfast or having a poor breakfast, sedentary habits) play a major role and are associated with obesity in childhood and adolescence. Skipping breakfast results in an unrecommended calorie intake between meals or a higher calorie intake in the following meals, thus triggering weight gain.¹⁸

The National Survey on Nutrition and Health (2004-2005) revealed the problem in Argentina and evidenced the prevalence of obesity over malnutrition.¹⁹ Meanwhile, the Second Worldwide Survey on School Health²⁰ reflected a 28.6% and a 5.9% overweight and obesity prevalence, respectively. Kovalskys²¹ observed that 20.8% of adolescents were overweight and 5.4% were obese; these figures are lower than those observed in our study, which alarmingly showed that the obesity prevalence reached 18.4%, with no differences between urban and peri-urban schools.

Both the American Academy of Pediatrics²² and the Food Guidelines for the Argentinean Population²³ recommend having breakfast every day to prevent obesity in children and highlight the relevance of including all food groups. Studies have proposed that a higher percentage of obese children skip breakfast compared to normal weight children, and breakfast is identified as

a protective factor for an adequate nutritional status.

Both in the United States⁷ and in Greece,²⁴ the prevalence of obesity was significantly higher among children and adolescents who skipped breakfast compared to those who had breakfast whereas, in Brazil,²⁵ breakfast was reversely associated with excess weight. Among students in our study, girls accounted for 40.7% of those who skipped breakfast and 54.7% of boys were overweight or obese.

“Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food.”²⁶ Families living in the peri-urban areas and who have a lower socioeconomic level find it harder to practice a healthier lifestyle, and their access to a varied diet is limited. Our study showed that, in peri-urban schools, 64.1% of students had skipped breakfast on the day of the survey compared to 46.1% of those from urban schools ($p= 0002$).

As per the enKid study,¹⁰ the quantity and quality of breakfast are conditioned by the presence of parents and a better family socioeconomic and cultural level. Data obtained from the ENERGY project,²⁷ conducted in European adolescents, found a positive relationship among parental level of education,

TABLE 5: Logistic regression model in relation to the absence of breakfast habit among public school students from Salta

Outcome measures	OR	95% CI		p value
		Lower limit	Upper limit	
Large family				
Up to 5 family members	1			
≥ 6 family members	2.42	1.26	4.62	0.008*
Does the father have breakfast?				
Always	1			
Sometimes / never	3.68	1.82	7.47	0.000*
Does the mother have breakfast?				
Always	1			
Sometimes / never	2.29	0.93	5.60	0.07
Years of education completed by the mother				
≥ 12 years	1			
< 12 years	1.84	0.96	3.51	0.066
Commensality				
Together as a family	1			
Alone	3.71	0.84	16.27	0.083
Nutritional status				
Normal / malnutrition	1			
Overweight	0.83	0.40	1.72	0.62
Obesity	2.91	1.21	6.98	0.017*

* P < 0.05.

OR: odds ratio; CI: confidence interval

breakfast habit, and participation in sporting activities.

Our study showed an association among the number of years of education completed by the parents, the characteristics of the parental hub, and the absence of breakfast habit. Family characteristics were underscored because these had a major impact on family members' health and behavior, including eating habits. Families deeply affected by economic deprivation were not able to warrant a daily, good-quality breakfast. Determining factors associated with skipping breakfast included being part of a large family and the absence of parental breakfast habit.

Results obtained by Quintero-Gutiérrez¹¹ were similar in that the percentage of students skipping breakfast came from poorer regions and larger families. An extended family in an adverse economic context reduced the possibility of choosing sufficient/healthy food. In Finland,²⁸ it was demonstrated that sharing breakfast with parents was the most relevant factor associated with the breakfast habit in their children.

The assessment of the relationship between nutritional status and breakfast habit showed that the probability of skipping breakfast was 2.91 times higher among obese students compared to normal weight students. Berta et al.¹⁴ studied the dependency ratio between breakfast frequency and nutritional status and observed a higher risk for overweight/obesity among those who skipped breakfast on a daily basis compared to those who had breakfast (OR: 1.48). Although this analysis used the breakfast habit as dependent outcome measure, other studies²⁹ suggested that the association between skipping breakfast and the overweight/obesity prevalence was global, regardless of socioeconomic and cultural differences among countries.

Given this study's characteristics, it was not possible to make inferences about the general student population; the study sample was representative only of the studied schools.

CONCLUSION

Among students from assessed schools, a relationship was observed among the habit of skipping breakfast, sociodemographic outcome measures, and nutritional status. This situation was closely related to the characteristics of modern life: extended families, breakfast habit in the parents, level of parental education, and eating together as a family. ■

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